Qualitative character and sensory representation

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Abstract

Perceptual experience seems to involve distinct intentional and qualitative features. Inasmuch as one can visually perceive that there is a Coke can in front of one, perceptual experience must be intentional. But such experiences seem to differ from paradigmatic intentional states in having introspectible qualitative character. Peacocke (1983) argues that a perceptual experience’s qualitative character is determined by intrinsic, nonrepresentational properties. But Peacocke (2001, 1992) also argues that perceptual experiences have nonconceptual representational content in addition to conceptual content and nonrepresentational sensational properties. He thus distinguishes between conceptual, nonrepresentational, and nonconceptual but representational aspects of perceptual experience. I will argue that Peacocke posits too much. Contrary to his (1983) arguments, the sensational properties Peacocke claims are nonrepresentational are best construed as representational; they are best explained in terms of their relation to the perceptible properties they enable us to perceive. Since sensational properties are arguably nonconceptual, they are best construed as nonconceptual representational properties. I offer the Homomorphism View of sensory qualities, pioneered by Sellars (1956), as a unified account of qualitative character and nonconceptual sensory representation. According to this view, a sensory quality represents a perceptible stimulus property in virtue of resembling and differing from other sensory qualities in ways parallel to the ways the stimulus property resembles and differs from other perceptible properties.

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1. Introduction

Perceptual experience seems to involve distinct intentional and qualitative features. Inasmuch as one can visually perceive that there is a Coke can in front of one, perceptual experience must be intentional. But such experiences seem to differ from paradigmatic intentional states in having introspectible qualitative character.

Qualitative character is often thought to be determined by intrinsic, nonrepresentational properties. Peacocke (1983), for one, argues that what it’s like to have a perceptual experience is independent of the representational properties of the experience. But Peacocke (2001, 1992) also argues that perceptual experiences have nonconceptual representational content in addition to conceptual content and nonrepresentational sensational properties. He thus distinguishes between conceptual, nonrepresentational, and nonconceptual but representational aspects of perceptual experience.

I will argue that Peacocke posits too much. Contrary to his (1983) arguments, the sensational properties Peacocke claims are nonrepresentational are best construed as representational; they are best explained in terms of their relation to the perceptible properties they enable us to perceive. Since sensational properties are arguably nonconceptual, they are best construed as nonconceptual representational properties.

I offer the Homomorphism View of sensory qualities, pioneered by Sellars (1956), as a unified account of qualitative character and nonconceptual sensory representation. This view might recall informational approaches (Dretske, 1995; Tye, 1995) which explain sensory representation in terms of the causal relations between mental properties and perceptible properties. However, the Homomorphism View differs from informational approaches in explaining the correlation between sensory qualities and perceptible properties in a way that accounts, not only for the perceptual role of sensory qualities, but also for their contribution to the introspectible qualitative character of sensory experience.

2. Sensational properties are representational

Peacocke argues that an explanation of perceptual experience involves more than an account of the properties in virtue of which one perceives stimuli. Perceptual experiences have nonrepresentational features as well.

To illustrate this claim, Peacocke appeals to the phenomenon of size constancy. Imagine looking at two trees of the same height but at different distances from you. Your experience represents the trees as being the same height and size, and you judge them to be so. “Yet,” writes Peacocke, “there is also some sense in which the nearer tree occupies more of your visual field than the more distant tree. This is as much a feature of your experience itself as is its representing the trees as being the same height.” (1983, p. 12). Peacocke concludes that since one’s experience cannot

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1 See, for instance, Block (1978) and Nagel (1974).
veridically represent the two trees as being the same size while representing one tree as occupying more of the visual field, the latter must be explained as a nonrepresentational feature of the experience.

Peacocke calls these nonrepresentational features sensational properties. Though they are nonrepresentational, sensational properties bear certain counterpart relations to perceptible stimulus properties. For instance, in normal viewing conditions, one’s visual experience of a Coke can differs from one’s visual experience of a lime. They are qualitatively different; what it is like to see a Coke can is different from what it is like to see a lime. The former is an experience of red and the latter is an experience of green. Sensational properties are what make these experiences qualitatively different.

Peacocke refers to sensational properties with primed predicates. An experience of red is red' and an experience of green is green'. Likewise for sensational properties corresponding to perceptible spatial properties. An experience of a basketball is round' and an experience of something that occupies a large portion of the visual field is large'.

Peacocke’s example seems to preclude size' properties from representing stimulus size. The experience of one tree is a different size’ from the experience of the other tree, yet the experiences represent the trees as being the same physical size.² If size’ represented stimulus size, the experience would have contradictory representational contents, since it would represent the trees as being different sizes while also representing them as being the same size. Since the experience clearly represents the trees as being the same size, size' cannot be representational.

But this argument trades on the equivocation of ‘visual field.’ And disambiguating this expression reveals that Peacocke’s conclusion is false.

A tree can only occupy a portion of the visual field if the visual field is a physical, spatial region, such as the region containing all visibly perceived stimuli at a given time. This three-dimensional region of space is, arguably, the commonsense notion of a visual field. But the visual field Peacocke discusses is not three-dimensional. He claims that the nearer tree occupies more of the visual field than the farther tree. Since the trees are the same size, the nearer tree does not occupy more of the three-dimensional region in front of the eyes, it occupies the same amount.

But the visual field can be described as a two-dimensional projection of the three-dimensional field. In this case, the nearer tree occupies more of the visual field than the farther tree, as evidenced by its subtending a larger retinal angle than the farther tree.³ But in this case, size’ does correspond to a perceived property of a stimulus: it

² I will sometimes describe perceptual experiences in terms of constituent experiences. When one has an experience of a red triangle and a blue square, one has an experience of a red triangle and an experience of a blue square. The experience of the two trees in Peacocke’s example includes an experience of the nearer tree and an experience of the farther tree.

³ The size of a retinal image is determined by the visual angle, “...the angle between the lines drawn from the opposite edges of the [stimulus] through the center of the pupil of the eye.” (Levine, 2000, p. 257) The size of the retinal image, or the retinal angle, is identical to the visual angle. Measuring retinal images in terms of this angle is important because the size of the retinal image is a function of a stimulus’ size and distance, not just its size.
corresponds to the property in virtue of which it occupies a particular portion of the visual field. And one’s experience can represent the two trees as being the same size and as subtending different retinal angles without having contradictory representational contents. Objects of the same size and at different distances from the retina do, in fact, subtend different retinal angles. And objects of different sizes at different distances can subtend the same retinal angle. So size represents the property in virtue of which a stimulus subtends a particular retinal angle.

If Peacocke takes the visual field to be a two-dimensional projection of the three-dimensional visual field, his argument fails because the experience does not represent the trees as both the same and different sizes. Rather, the experience represents the trees as the same size relative to the three-dimensional visual field and as different sizes relative to the two-dimensional projection field.

But Peacocke describes the different amounts of visual field occupied by the trees as features of the experience, not features of the trees. And, since experiences are mental, an experience of a tree can only occupy part of the visual field if the visual field is mental. We can construct such a mental field out of spatial properties. This field is a two-dimensional array of sensations. It is not a space occupied by visual stimuli, such as the two visual fields described above.

To understand the claim of a mental visual field, consider hallucinations. One can hallucinate a red square to the left of a green circle. Since neither a red square nor a green circle is present, the red, green, square, and circle one experiences must be properties of one’s hallucination. And since one experiences one as being to the left of the other, the hallucination must have properties corresponding to locations. But something can be to the left of another only relative to a frame of reference. For instance, from my side of a chess board, my queen is to the left of my king. But from my opponent’s side, it is to the right of my king. Since the hallucinations are mental, they are not located in front of one’s eyes in a distal visual field. So they must be located, in some sense, in a mental field. This mental visual field consists of the mental spatial relations among visual experiences.

If the visual field Peacocke refers to is a mental visual field, then the experiences of the trees, not the trees themselves, occupy different proportions of the visual field. In virtue of these different proportions the experiences have different sizes. And, according to Peacocke’s argument, since the experience represents the two trees as being the same size and, since the experiences of the trees occupy different proportions of the mental visual field, occupying a proportion of the mental visual field must be a nonrepresentational feature of experience.

But, again, such differences in size do correspond to differences between the trees themselves: they correspond to the difference in the retinal angles subtended by the trees. Thus, size represents the property in virtue of which a stimulus occupies a certain amount of a nonmental two-dimensional visual field.

Though size represents a perceptible property of visual stimuli, it does not represent the size of a stimulus. A twenty-foot tree and a forty-foot tree may both cause an experience one-half the height of the mental visual field, depending on how far each is from the perceiver. So, the size of one’s experience is insufficient for determining the size of a stimulus. But this does not preclude size from being representational. It is partly in virtue of an experience’s size that we come to determine the
size and distance of a stimulus. Thus, size’ can be explained as a feature of Marr’s (1982) primal sketch. Determining the size of a stimulus requires further processing involving depth cues, such as motion parallax and binocular rivalry. But size’ represents a stimulus property nonetheless.

Size’ properties represent disjunctive properties or equivalence classes of properties. All stimuli that subtend the same retinal angle are identical with respect to this property. And this perceiver-relative property is a function of the size of a stimulus and its distance from the perceiver.

The size’ relations, larger’, smaller’, and same-size’, represent disjunctive relations or equivalence classes of relations. In Peacocke’s example, one tree is larger or nearer than the other. That tree is also nearer than the other tree. It is partly in virtue of representing one tree as larger or nearer than the other that our experience comes to represent it as nearer and the same size as the other.

Alternatively, the property that larger’ represents can be described as an equivalence class. The members of this class are all of the properties in virtue of which stimuli subtend a greater retinal angle than the object to which they are compared. Stimuli of many different sizes and distances have this property.

The crucial point is that size’ properties and relations represent perceptible properties and relations even though they are indiscriminant between size and distance. And one detects these perceptible properties in virtue of having experiences of different sizes’. The indiscrimination of size’ does not preclude it from being representational.

But Peacocke addresses a similar suggestion due to Irvin Rock. According to Rock (1975), a visual experience represents two distinct stimuli: a distal stimulus and a proximal stimulus. The distal stimulus is the object projecting an image on the retina. The proximal stimulus is the retinal image itself. Extending this to Peacocke’s example, one’s experience represents the different retinal angles subtended by the trees as well as the size of the trees themselves. Peacocke (1983, pp. 19–20) argues that this suggestion fails because mental representation requires concepts. But, he claims, the two trees will occupy different proportions of a creature’s visual field even if that creature lacks a concept of subtended angle. The creature’s experiences of the trees will differ even if the creature lacks the conceptual resources to understand why they differ.

My view differs from Rock’s in taking size’ to represent properties of distal stimuli, not retinal images. Size’ represents the perceiver-relative stimulus property that causes a subtended retinal angle, it does not represent the subtended angle itself.

More importantly, as I have argued, any creature that has the experience of the two trees does, in fact, have a representation of the trees as differing with respect to the retinal angle each subtends. Without such a representation, the experience could not represent the trees as being the same size and at different distances. The distance and size of a particular stimulus can only be determined with the aid of further visual cues, such as those provided by motion parallax, binocular disparity, shading, and texture gradients. If a creature must possess concepts in order for its experiences to represent, then any creature that can perceive the two trees as being the same size does, in fact, have the relevant concepts.
But there are good reasons to reject Peacocke’s claim that mental representation always involves concepts. First, pretheoretic intuitions suggest a distinction between the sensory and conceptual aspects of perceptual experience. We must either explain this distinction or explain why we wrongly make this distinction.

Second, perceptual experiences are modality specific. One can only see colors and one can only hear sounds. Even spatial experience is modality specific. One can visually localize only stimuli that are in front of one’s eyes. But one can hear stimuli in any direction. So visual location and auditory location are distinct modality-specific properties. But concepts can be amodal. One’s concept of a particular kind of bird might be that of some winged creature of a certain color, that makes a certain sound, or that has soft feathers. The concept of that bird rests on no particular sense modality.

Finally, Peacocke (1992, 2001), himself, and others⁴ argue for the existence of nonconceptual representational content. If there is nonconceptual content, then Peacocke’s (1983) argument against Rock fails because one’s experience can represent a certain property without one possessing the concept of that property. So, one need not possess the concept of a subtended angle in order to perceive one.

I will outline three of Peacocke’s (1992, 2001) arguments for nonconceptual content.

3. What might nonconceptual content be?

Understanding Peacocke’s arguments for nonconceptual content requires some understanding of his theory of conceptual content. According to Peacocke, concepts are constituents of the contents of propositional attitudes. Further, they are subject to Fregean considerations of cognitive significance (1992, p. 3). Two concepts are identical only if substituting one for the other in a propositional attitude context preserves its cognitive information.

Further, concepts are individuated by what it is to possess them; they are individuated by their functional roles. Perceptual concepts, such as RED, are individuated by their roles in the formation of perceptual judgments.

Peacocke writes:

We may individuate a perceptual concept C in part by a statement of this form: it is that concept C to possess which a thinker must be willing to judge that certain things are C in such and such circumstances in which he perceptually experiences them as falling under C… (1992, pp. 88–89)

So, the possession conditions for the concept RED will be:

RED is that concept to possess which a thinker must be willing to judge that certain things are red in such and such circumstances in which he perceptually experiences them as falling under RED.

A creature possesses the concept RED if and only if it can mentally affirm that an object is red when the creature sees it. But such possession conditions are circular if one must possess the concept RED in order to see red things. This circle is broken if perceptual experiences can represent stimuli as red without involving the concept RED. This suggests that perceptual experiences have nonconceptual content.

On this account, normal perceptual experiences do involve concepts. But if perceptual concepts are individuated by their roles in the formation of perceptual judgments, then, in order to form a perceptual judgment that there is something red in front of one, one’s experience must nonconceptually represent the presence of a red surface. Were we to have such states in the absence of the concept RED, we would be unable to mentally affirm that there is such a surface there. But in the absence of nonconceptual representation, we could not explain what it is to possess such a concept.5

The second argument I will address invokes nonconceptual content to explain the rational justification of perceptual beliefs. According to Peacocke, we would not be justified in forming perceptual beliefs based on our perceptual experiences unless those experiences represented the world as being a certain way (1992, p. 80). One would only form the perceptual belief that there is a red can in the center of one’s visual field if one’s visual experience represented the presence of a red cylindrical surface at the center of one’s distal visual field.

Peacocke insists that our nonconceptual states are representational in the sense that they have correctness conditions; they can correctly and incorrectly represent the environment as being a certain way. Perceptual beliefs are justified because such experiences are normally veridical.6

We can form a similar argument without appealing to rational justification. The representational content of perceptual experiences explains why we form perceptual beliefs based upon those experiences, and why such beliefs are reliable. In this case, nonconceptual content is posited to explain why we make the perceptual judgments we make, and why those judgments are reliable.

Perhaps the most intuitive argument for nonconceptual representation is that perceptual experience is fine-grained and analogue in nature, whereas concepts are digital or coarse-grained (1992, pp. 68–69). For instance, one can distinguish a novel shape from other shapes. Nonetheless, one cannot have a concept of a shape one has never seen before. So our ability to perceive novel properties indicates the existence of nonconceptual representation.

Also, one sees the size of a stimulus independent of any particular units of measurement. For instance, one can see the width of a table without seeing it as

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5 Cussins (1990) and Peacocke (2001) offer a similar argument for the acquisition of perceptual concepts. We could not acquire RED from our visual experiences if having such experiences already required possession of RED. On this view, nonconceptual content is needed to avoid positing innate perceptual concepts.

6 Peacocke (2001) takes the correctness conditions of nonconceptual content as a distinguishing mark between nonconceptual content and sensational properties. However, this is simply to claim that sensational properties are nonrepresentational. It is not an independent reason for taking sensational properties to be nonrepresentational.
measuring a certain number of feet across. And one can see that a stimulus is larger than another without seeing their sizes in inches, feet, or centimeters.

Since perceptual experiences involve nonconceptual representation and, since the qualitative character of perceptual experience is representational, identifying sensational properties with nonconceptual representational properties gives us an economical explanation of perceptual experience.

The next step is to explain the correspondence between sensational properties and perceptible properties. What is the nature of the relation between a red’ square’ off-to-the-left’ experience and a red square off-to-the-left?

4. Sensory representation

According to a naive pictorial view of sensory representation, sensational properties represent perceptible properties in virtue of resembling or being identical to them. A portrait represents a person in virtue of resembling the person; the portrait and the person have properties in common.

But this model will not work for sensory representation. Experiences are states so they have state properties, not object properties. Red, however, is a property of perceptible objects and surfaces. So red’ experiences do not represent red surfaces in virtue of an identity between red’ and red.

More striking is a problem the naive view encounters with respect to spatial representation. If sensational properties resemble or are identical to their perceptible counterparts, the mental visual field will be a two-dimensional spatial array of experiences. And experiences of squares will, themselves, be square. Where are these mental squares located? Perhaps they are located in the mental visual field. But then where is this visual field located?7

More importantly, taking the mental visual field as spatially extended does nothing to explain visual perception. The naive view is appealing only if we think that in order to see visual stimuli we scan the mental visual field. On this view, we would have to look through or at the mental visual field in order to see stimuli in the distal visual field. But to do this, we would need another mental visual field to mediate perception of the first. This solution leads to regress. Therefore, the mental visual field is not spatial.8

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7 Some argue (e.g., Smythies, 1994) that visual spatial representations are topographical maps in visual cortex. According to this view, the mental visual field is a neural field located in the brain. But such cortical maps are discontinuous and widely distributed (see Van der Heijden, Musseler, & Bridgeman, 1999); they simply fail to reflect the metrical properties and unity of the perceptible visual field.

8 This is not a criticism of inner-sense theories of consciousness, such as those offered by Armstrong (1980) and Lycan (1996). Rather, I am criticizing the view that in order to see we must look through or at a visual field. In addition, this view need not be committed to an internal eye, so it need not commit to a regress of visual fields. Nevertheless, the internal modality will have to represent the spatial relations of the visual experiences with a sensory field of its own. And this will lead to a regress of sensory fields whatever modality is involved.
The Homomorphism View of sensory representation, offered by Sellars (1956), Rosenthal (1998, 1999, 2001), and Meehan (2001), provides an explanation of sensory representation that avoids the naive pictorial view. According to the Homomorphism View, introspectible mental qualities, called sensory qualities, represent perceptible properties in virtue of relations between their respective families of properties. Following Sellars (1967), I flag reference to a sensory quality by suffixing a "*" to a predicate. One's visual experience of a red stimulus under normal conditions is red*. I will suggest that identifying Peacocke's sensational properties with sensory qualities provides a unified explanation of qualitative character and nonconceptual representation.

We can explain the relationship between sensory qualities and perceptible properties in terms of a correspondence each family of sensory qualities bears to a family of perceptible properties. An experience of a red square is not literally red, it is red*. And red* corresponds to perceptible red in virtue of resembling and differing from other mental colors in ways parallel to the ways red resembles and differs from other colors. Just as red is more similar to orange than it is to green, red* is more similar to orange* than it is to green*.

This view also accounts for spatial* sensory qualities and the mental visual field. Spatial* properties are not spatial. Rather, they are properties that differ from and resemble other sensory qualities in ways that parallel the ways spatial properties differ from and resemble one another.

For instance, shape* properties are mental counterparts of perceptible shapes. Just as squares are more similar to rectangles than they are to circles, square* is more similar to rectangular* than it is to circular*. And location* properties of visual experience are the mental counterparts of perceiver-relative locations of visual stimuli—e.g., the property of being off to the left in one's two-dimensional distal visual field.

The mental visual field comprises the sum of locations* of visual sensory qualities at a given time. This field is bound by sensory experiences beyond which there are no other sensory experiences. For instance, the left* boundary is fixed by the visual experience to the left* of which no other visual experiences are located*. The mental visual field is not spatial, it is spatial*. A visual experience represents the presence of a red stimulus at the center of one's distal visual field in virtue of being a red* experience at the center-of-the-visual-field*.

Visual size* properties are proportional properties of the mental visual field. One's experience of a red patch is larger* than that of a green patch when there are more red* contiguous locations* in one's mental visual field than there are green* ones.10

9 Clark (1993) and Shoemaker (1975) offer similar views. However, Clark (1996, 2000) argues that this view cannot account for spatial experience. See Meehan (2001) for arguments that the Homomorphism View does explain spatial experience.

10 Locations* are the introspectible mental counterparts of minimum visibilia. If there are minimum visibilia—minimally discriminable points in a two-dimensional projection of space—then there must be mental counterparts to account for our perception of them.
In Peacocke’s example, the experience caused by the nearer tree is larger* than that caused by the farther tree. In virtue of its being larger*, the experience of the nearer tree represents it as being larger or nearer than the other tree. This is because the sensory quality larger* occupies the same position in the relative size* family as being larger or nearer occupies in its property family.

The visual experience also represents the nearer tree as nearer than and the same size as the other tree. But this need not be explained solely in terms of sensory qualities. It could be that we infer size and distance (see Berkeley, 1975/1732; Rock, 1975) or that perception of size and distance results from lower-level processing (see Marr, 1982). But neither of these solutions precludes the representational status of spatial* properties.

But the Homomorphism View does not simply avoid the naive pictorial view of sensory representation. The homomorphisms it posits are needed to explain the perceptual discriminations we make. We can visually discriminate between differently colored, shaped, sized, and located stimuli. So visual experiences must have differences corresponding to these perceptible differences. Qualitatively identical visual experiences cannot enable discrimination between red and green. They must have mental counterparts of perceptible red and green. And one’s ability to perceptually match stimuli suggests that one has qualitatively identical experiences. That we can match two stimuli according to shape indicates that our experiences share some mental property corresponding to that shape.

But, in addition to discriminating and matching, we also perceive varying degrees of difference and similarity among stimuli. Red is more similar to orange than it is to green. And we see squares as being more similar to rectangles than they are to triangles. Our experiences can only enable us to perceive these degrees of similarity and difference if the experiences have properties that differ from and resemble one another in ways parallel to the ways perceptible properties differ from and resemble one another. Sensory qualities are just those properties that bear these similarity and difference relations.11

That we perceive these similarities and differences among perceptible properties is further supported by the quality spaces revealed by perceptual matching. As Goodman (1977) pointed out, perceptual matching is intransitive. One can fail to discriminate between color patches A and B, and between B and another patch C, while discriminating between A and C. One perceptually matches B with both A and

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11 Sensory qualities, such as red* and square*, do not represent perceptible properties, such as red and square, as relations between families of perceptible properties and families of sensory qualities. Such a view would be circular and would lead to a regress, as was pointed out to me by an anonymous referee. Rather, sensory qualities are functional properties posited to explain our perceptual discriminations. That we make the discriminations we make indicates that we have sensory qualities corresponding to these perceptible differences. That we perceive similarities and differences between perceptible properties indicates that the properties that enable us to perceive them resemble and differ in parallel ways. So red* represents red in virtue of resembling and differing from other colors* just as red resembles and differs from other colors. Red* does not represent red as a relation between colors* and colors.
C but discriminates between A and C. This indicates that one perceives differences between A, B, and C. However, it also indicates that one perceives A as closer to B than to C. This suggests an ordering of properties with B between A and C. That one discriminates in this way suggests that one's visual perceptions have properties that correspond to A, B, and C in virtue of occupying the same places in their quality space as A, B, and C occupy in theirs.\(^\text{12}\)

Our ability to discriminate with respect to degrees of similarity and difference helps explain the fine-grained nature of perceptual experience. Though we lack the concept needed to categorize a particular novel shape, we can see that shape in virtue of its similarities to and differences from other shapes. It is in virtue of detecting these similarities and differences that we are able to see the novel shape as distinct from other shapes.

Peacocke's sensational properties can be identified with the Homomorphism View's sensory qualities to explain sensory, or nonconceptual representation. In the case of size', the perceptible counterparts are not sizes, they are perceiver-relative two-dimensional projection properties. And we perceive these properties as resembling and differing from one another in varying degrees. A twenty-foot tree twenty feet away is more similar, in this respect, to a fifty-foot tree forty feet away than it is to an eighty-foot tree forty feet away.

In Peacocke's example, though one is aware of the two trees as being the same size, one is also aware of the sensory qualities of the experience. Being aware of these qualities depends on one's being aware of some difference between the two trees. One is aware of one's experience as the type one has when one sees stimuli with different perceiver-relative two-dimensional projection properties. And that experience is typed by properties that resemble and differ from one another in ways parallel to the ways perceiver-relative two-dimensional projection properties resemble and differ from one another.

The Homomorphism View thus explains the qualitative character of perceptual experience and its nonconceptual representational content. Identifying Peacocke's sensational properties with sensory qualities enables us to identify them with non-conceptual representational properties. On this view, a sensational property represents a perceptible property in virtue of resembling and differing from other sensational properties in ways homomorphic to the ways that the perceptible property resembles and differs from other perceptible properties. Being a certain sensational property is just a matter of representing a certain perceptible property. We are left with a unified explanation of qualitative character and nonconceptual, sensory representation.\(^\text{13}\)

\(^{12}\) See Clark (1993) for a detailed treatment of such quality spaces.

\(^{13}\) I am indebted to David Rosenthal, Roblin Meeks, Josh Weisberg, Pete Mandik, and an anonymous referee for helpful comments on this paper. Earlier versions were presented at the 2001 meeting of the Association for a Scientific Study of Consciousness in Durham, North Carolina, the 2001 meeting of Toward a Study of Consciousness in Skovde, Sweden, and the fall 2001 meeting of the New Jersey Regional Philosophy Association in Lodi, New Jersey; I am indebted to Jonathan Waskan for helpful comments at the NJRPA meeting.
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